



# Quantifying the effects of anagenetic and cladogenetic evolution

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An ongoing debate in evolutionary biology is whether phenotypic change occurs predominantly around the points of speciation or does it accumulate gradually over time. In this work we propose a general framework incorporating both types of change, quantify the effects of punctuated equilibrium via the interspecies correlation coefficient and attribute the proportion of change to each one. We discuss results of parameter estimation of Hominoid body size in this light. In addition we derive the probability generating functions of the number of speciation events along a random lineage and from the most recent common ancestor of two randomly chosen tip species for a conditioned Yule tree. Using them we obtain the variance in closed form of the distance from the root to the most recent common ancestor of two randomly chosen tip species.

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